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SEQUENCE LISTING

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DENICH, KENNETH
SCHMIDT, M. ALEXANDER

<120> IMMUNOGENIC PILI PRESENTING FOREIGN PEPTIDES, THEIR
PRODUCTION AND USE

<130> 050939/0104

<140> 09/833,079
<141> 2001-04-12

<160> 39

<170> PatentIn Ver. 2.1

<210> 1
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 1
Pro Gln Gly Gln Gly Lys Val Thr
1 5

<210> 2
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 2
Ala Lys Phe Gly Gly Met Gly Ala Lys Lys Gly
1 5 10

<210> 3
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 3
Pro Gln Gly Gln Gly Glu Val Ser Phe
1 5

<210> 4
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 4
Asn Phe Lys Gln Leu Gln Gly Gly Ala Ala Lys Lys Gly
1 5 10

<210> 5
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 5
Pro Gln Gly Gln Gly Lys Val Thr Phe
1 5

<210> 6
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 6
Asn Phe Lys Lys Ala Ala Gly Gly Gly Ala Lys Thr
1 5 10

<210> 7
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 7
Gln Gly Ser Gly Gln Val Asn Phe Lys Gly
1 5 10

<210> 8
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 8
Asn Phe Lys Lys Ala Ala Thr Pro Gly Gly Ala Ala Lys Thr
1 5 10

<210> 9
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 9
Ile Pro Gln Gly Gln Gly Lys Val Thr Phe Asn Gly
1 5 10

<210> 10
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 10
Ile Pro Glu Gly Gln Gly Lys Val Thr
1 5

<210> 11
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 11
Asn Gly Gly Thr Val His Phe Lys Gly Glu Val Val Asn
1 5 10

<210> 12
<211> 12

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

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1 5 10

<210> 13
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 13
Pro Gln Gly Gln Gly Glu Val Thr
1 5

<210> 14
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 14
Pro Gln Gly Gln Gly Glu Val Ala
1 5

<210> 15
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
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peptide

<400> 15
Thr Thr Val Asn Gly Gly Thr Val His
1 5

<210> 16
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 16
Ile Pro Gln Gly Gln Gly Lys Val Thr Phe Asn Gly Thr Val
1 5 10

<210> 17
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 17
Ala Lys Phe Gly Gly Met Gly Ala Lys Lys Gly
1 5 10

<210> 18
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 18
attnaacccctc actaaag

17

<210> 19
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 19
aatacgtactc actatag

17

<210> 20
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 20
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16

<210> 21
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<212> DNA
<213> Artificial Sequence

<220>
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<400> 21
atgagactgc gattctctgt 20

<210> 22
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

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<210> 23
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 23
cctgaaatac gagaatatta 20

<210> 24
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 24
taatattctc gtatccagg 20

<210> 25
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 25
tggactggta taacaatcga 20

<210> 26
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<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 26
tccgttcgc acaattctga 20

<210> 27
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 27
agtggattca tgcagcattt ctagaaa 27

<210> 28
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 28
tggacccct gagcta 16

<210> 29
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 29
ggggcagccc tgccgtccca aat 23

<210> 30
<211> 19
<212> DNA
<213> Artificial Sequence

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<220>
<223> Description of Artificial Sequence: Primer

<400> 30
aaacaccatg aaacacaca                                         19

<210> 31
<211> 588
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      pHUR849 plasmid

<220>
<221> sig_peptide
<222> (1)..(66)

<220>
<221> mat_peptide
<222> (67)..(585)

<220>
<221> CDS
<222> (1)..(585)

<400> 31
atg aga ctg cga ttc tct gtt cca ctt ttc ttt ggc tgg ttt      48
Met Arg Leu Arg Phe Ser Val Pro Leu Phe Phe Gly Cys Val Phe
      -20                  -15                  -10

gtt cat ggt gtt ttt gcc ggt ccg ttt cct ccg ccc ggc atg tcc ctt  96
Val His Gly Val Phe Ala Gly Pro Phe Pro Pro Gly Met Ser Leu
      -5                  -1      1                  5                  10

cct gaa tac tgg gga gaa gag cac gta tgg tgg gac ggc agg gct gct 144
Pro Glu Tyr Trp Gly Glu His Val Trp Trp Asp Gly Arg Ala Ala
      15                  20                  25

ttt cat ggt gag gtt gtc aga cct gcc tgg act ctg gcg atg gaa gac 192
Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp
      30                  35                  40

gcc tgg cag att att gat atg ggg gaa acc ccg gta cgg gat tta cag 240
Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln
      45                  50                  55

att ggt ttc tcc gga cct gaa aga aaa ttc agc ctc cgg ctc agg aat 288
Ile Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn
      60                  65                  70

tgt gaa ttt aac agt cag ggt ggg aac ctt ttc tct gat tcc cgg ata 336
Cys Glu Phe Asn Ser Gln Gly Asn Leu Phe Ser Asp Ser Arg Ile
      75                  80                  85                  90

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agg gtg act ttc gat ggc gtc cg	gg gat aag ttt aat	384	
Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn			
95	100	105	
tta tcc ggt cag gca aaa ggc att aat ctg cag ata gct gat gtc agg		432	
Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Val Arg			
110	115	120	
gga aat att gcc cg gca gga aaa gta atg cct gca ata cca ttg acg		480	
Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr			
125	130	135	
ggt aat gaa gaa gcg ctg gat tac acc ctc aga att gtg aga aac gga		528	
Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly			
140	145	150	
aaa aaa ctt gaa gcc gga aat tat ttt gct gtg ctg gga ttc cgg gtc		576	
Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val			
155	160	165	170
gat tat gag tga		588	
Asp Tyr Glu			

<210> 32

<211> 195

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Deduced amino acid sequence of synthetic pHUR849 plasmid

<400> 32

Met Arg Leu Arg Phe Ser Val Pro Leu Phe Phe Phe Gly Cys Val Phe			
-20	-15	-10	

Val His Gly Val Phe Ala Gly Pro Phe Pro Pro Pro Gly Met Ser Leu				
-5	-1	1	5	10

Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala			
15	20	25	

Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp			
30	35	40	

Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln			
45	50	55	

Ile Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn			
60	65	70	

Cys Glu Phe Asn Ser Gln Gly Gly Asn Leu Phe Ser Asp Ser Arg Ile			
75	80	85	90

Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn			
95	100	105	

Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Val Arg
 110 115 120

Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr
 125 130 135

Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly
 140 145 150

Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val
 155 160 165 170

Asp Tyr Glu

<210> 33

<211> 588

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 pDAL201B plasmid

<220>

<221> sig_peptide

<222> (1)..(66)

<220>

<221> mat_peptide

<222> (67)..(585)

<220>

<221> CDS

<222> (1)..(585)

<400> 33

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 Met Arg Leu Arg Phe Ser Val Pro Leu Phe Phe Cys Cys Val Phe
 -20 -15 -10

gtt cat tgt gtt ttt gcc ggt ccg ttt cct ccg ccc ggc atg tcc ctt 96
 Val His Cys Val Phe Ala Gly Pro Phe Pro Pro Gly Met Ser Leu
 -5 -1 1 5 10

cct gaa tac tgg gga gaa gaa cac gta tgg tgg gac ggc agg gct gct 144
 Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala
 15 20 25

ttt cat ggt gag gtt gtc aga cct gcc tgt act ctg gcg atg gaa gac 192
 Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp
 30 35 40

gcc tgg cag att atc gat atg ggg gaa acc ccg gtt cgg gat tta cag 240
 Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln
 45 50 55

att ggt ttc tcc gga cct gaa aga aaa ttc agc ctc cgg ctc agg aac	288
Ile Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn	
60 65 70	
tgt gaa ttt aac agt cag ggt ggg aac ctt ttc tct gat tcc cgg ata	336
Cys Glu Phe Asn Ser Gln Gly Asn Leu Phe Ser Asp Ser Arg Ile	
75 80 85 90	
agg gtg act ttc gat ggc gtc cgg ggt gaa acg ccg gat aag ttt aat	384
Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn	
95 100 105	
tta tcc ggt cag gca aaa gga att aat ctg cag ata gct gat gcc agg	432
Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Ala Arg	
110 115 120	
gga aat att gcc cgg gca ggg aaa gta atg cct gca ata cca ttg acg	480
Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr	
125 130 135	
ggc aat gaa gca gtc gat tac acc ctc aga att gtg cga aac gga	528
Gly Asn Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly	
140 145 150	
aaa aaa ctt gaa gcc gga aat tat ttt gcc gtg ctg gga ttc cgg gtc	576
Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val	
155 160 165 170	
gat tat gag tga	588
Asp Tyr Glu	

<210> 34

<211> 195

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Deduced amino acid sequence of synthetic pDAL201B plasmid

<400> 34

Met Arg Leu Arg Phe Ser Val Pro Leu Phe Phe Cys Cys Val Phe		
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Val His Cys Val Phe Ala Gly Pro Phe Pro Pro Pro Gly Met Ser Leu			
-5	-1 1	5	10

Pro Glu Tyr Trp Gly Glu His Val Trp Trp Asp Gly Arg Ala Ala		
15	20	25

Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp		
30	35	40

Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln		
45	50	55

Ile Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn
 60 65 70

Cys Glu Phe Asn Ser Gln Gly Gly Asn Leu Phe Ser Asp Ser Arg Ile
 75 80 85 90

Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn
 95 100 105

Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Ala Arg
 110 115 120

Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr
 125 130 135

Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly
 140 145 150

Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val
 155 160 165 170

Asp Tyr Glu

<210> 35

<211> 588

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 pDAL210B plasmid

<220>

<221> sig_peptide

<222> (1)..(66)

<220>

<221> mat_peptide

<222> (67)..(585)

<220>

<221> CDS

<222> (1)..(585)

<400> 35

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 -20 -15 -10

gtt cat ggt gtt ttt gcc ggt ccg ttt cct cct ccc ggc atg tcc ctt 96
 Val His Gly Val Phe Ala Gly Pro Phe Pro Pro Pro Gly Met Ser Leu
 -5 -1 1 5 10

cct gaa tac tgg gga gaa gag cac gta tgg tgg gac ggc agg gct gct 144
 Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala
 15 20 25

ttt cat ggt gag gtt gtc aga cct gcc tgt act ctg gcg atg gaa gac	192
Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp	
30 35 40	
gcc tgg cag att atc gat atg ggg gaa acc ccg gtt cgg gat tta cag	240
Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln	
45 50 55	
att ggt ttt tcc gga cct gaa aga aaa ttc agc ctc ccg ctc agg aac	288
Ile Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn	
60 65 70	
tgt gaa ttt aac agt cag ggt ggg aac ctt ttc tct gat tcc ccg ata	336
Cys Glu Phe Asn Ser Gln Gly Asn Leu Phe Ser Asp Ser Arg Ile	
75 80 85 90	
agg gtg act ttc gat ggc gtc ccg ggt gaa acg ccg gat aag ttt aat	384
Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn	
95 100 105	
tta tcc ggt cag gca aaa ggc att aat ctg cag ata gct gat gcc agg	432
Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Ala Arg	
110 115 120	
gga aat att gcc ccg gca ggg aaa gta atg cct gca ata cca ttg acg	480
Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr	
125 130 135	
ggt aat gaa gaa gcg ctg gat tac acc ctc aga att gtg aga aac gga	528
Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly	
140 145 150	
aaa aaa ctt gaa gcc gga aat tat ttt gcc gtg ctg gga ttc ccg gtc	576
Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val	
155 160 165 170	
gat tat gag tga	588
Asp Tyr Glu	

<210> 36
<211> 195
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Deduced amino acid sequence of synthetic pDAL210B plasmid

<400> 36
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Val His Gly Val Phe Ala Gly Pro Phe Pro Pro Pro Gly Met Ser Leu
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Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala
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<210> 37
<211> 588
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: Synthetic
pdAL200A plasmid

<220>
<221> sig_peptide
<222> (1)..(66)

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<220>
<221> mat_peptide
<222> (67) .. (585)
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<220>
<221> CDS
<222> (1) (585)

-100- 37

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 Met Arg Leu Arg Phe Ser Val Pro Leu Phe Phe Phe Cys Cys Val Phe
 -20 -15 -10

gtt cat ggt gtt ttt gcc ggt ccg ttt cct ccg ccc ggc atg tcc ctt	96
Val His Gly Val Phe Ala Gly Pro Phe Pro Pro Pro Gly Met Ser Leu	
-5 -1 1 5 10	
cct gaa tac tgg gga gaa gaa cac gta tgg tgg gac ggc agg gct gct	144
Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala	
15 20 25	
ttt cat ggt gag gtt gtc aga cct gcc tgg act ctg gcg atg gaa gac	192
Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp	
30 35 40	
gcc tgg cag att atc gat atg ggg gaa acc ccg gtt cgg gat tta cag	240
Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln	
45 50 55	
att ggt ttt tcc gga cct gaa aga aaa ttc agc ctc ccg ctc agg aac	288
Ile Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn	
60 65 70	
tgt gaa ttt aac agt cag ggt ggg aac ctt ttc tct gat tcc cgg ata	336
Cys Glu Phe Asn Ser Gln Gly Gly Asn Leu Phe Ser Asp Ser Arg Ile	
75 80 85 90	
agg gtg act ttc gat ggt gtc ccg ggt gaa acg ccg gat aag ttt aat	384
Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn	
95 100 105	
tta tcc ggt cag gca aaa ggc att aat ctg cag ata gct gat gcc agg	432
Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Ala Arg	
110 115 120	
gga aat att gcc ccg gca ggg aaa gta atg cct gca ata cca ttg acg	480
Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr	
125 130 135	
ggt aat gaa gaa gcg ctg gat tac acc ctc aga att gtg cga aac gga	528
Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly	
140 145 150	
aaa aaa ctt gaa gcc gga aat tat ttt gcc gtg ctg gga ttc ccg gtc	576
Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val	
155 160 165 170	
gat tat gag tga	588
Asp Tyr Glu	

<210> 38
 <211> 195
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Deduced amino acid sequence of synthetic pDAL200A plasmid

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 Val His Gly Val Phe Ala Gly Pro Phe Pro Pro Gly Met Ser Leu
 -5 -1 1 5 10

 Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala
 15 20 25

 Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp
 30 35 40

 Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln
 45 50 55

 Ile Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn
 60 65 70

 Cys Glu Phe Asn Ser Gln Gly Gly Asn Leu Phe Ser Asp Ser Arg Ile
 75 80 85 90

 Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn
 95 100 105

 Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Ala Arg
 110 115 120

 Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr
 125 130 135

 Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly
 140 145 150

 Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val
 155 160 165 170

 Asp Tyr Glu

<210> 39
 <211> 195
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Comparison
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 <220>
 <221> MOD_RES
 <222> (13)
 <223> Gly or Cys

 <220>
 <221> MOD_RES
 <222> (143)
 <223> Val or Ala

<400> 39
Met Arg Leu Arg Phe Ser Val Pro Leu Phe Phe Phe Xaa Cys Val Phe
1 5 10 15

Val His Gly Val Phe Ala Gly Pro Phe Pro Pro Pro Gly Met Ser Leu
20 25 30

Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala
35 40 45

Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp
50 55 60

Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln
65 70 75 80

Asn Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn
85 90 95

Cys Glu Phe Asn Ser Gln Gly Gly Asn Leu Phe Ser Asp Ser Arg Ile
100 105 110

Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn
115 120 125

Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Xaa Arg
130 135 140

Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr
145 150 155 160

Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly
165 170 175

Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val
180 185 190

Asp Tyr Glu
195